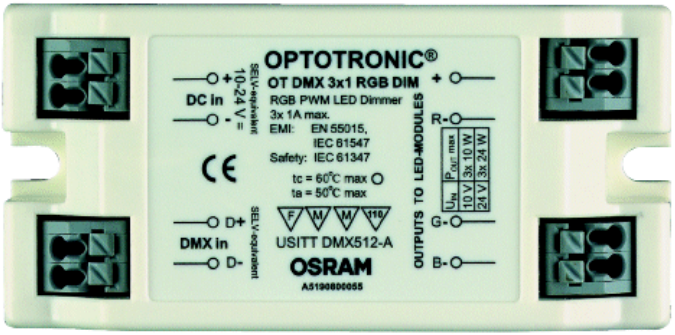
Operating instructions

I / 2010
Subject to change



DMX controlled dimmer unit for RGB LED-modules
OT DMX 3x1 RGB DIM Ver. 3.0

040808EN

OSRAM GmbH
Customer-Service-Center (CSC)
Steinerne Furt 62
86167 Augsburg, Germany

Tel. : (+49) 1803 / 677 - 200 (charges apply)
Fax.: (+49) 1803 / 677 - 202

www.osram.com
www.osram.de

Contents

General	Application and function	2
	Safety information	2
Installation	Design and dimensions	3
	Wiring diagram	3
	System extension	5
Operation	General functions	6
	Operation modes	6
	Addressing	6
Appendix	Troubleshooting	7
	Technical data	8

Application and function

The DMX protocol is established as one of the leading Lighting Management System protocol for dynamic RGB coloured lighting applications. The dimmer OT DMX 3x1 RGB DIM unit has been designed to be a suitable LED-module controller for a wide range of applications, when DMX protocol is adopted. The OT DMX 3x1 RGB DIM is a 3-channel PWM LED Dimmer unit for 10 V and 24 V LED-modules providing a DMX control interface and PWM LEDdrivers as output. It is designed especially for RGB colormixing applications by controlling the brightness of individual LED modules.

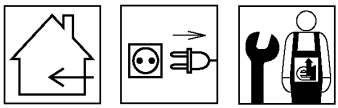
Main applications:

- Large area effect lighting in architecture or cove lighting applications
- Colour light effects and design-oriented lighting as creative element in discotheques, theatres, concerts etc.

Main control unit advantages:

- Full dimming range 0 −100%
- Protection class II
- Auto-reset in case of open-circuit, overload and over temperature
- Short circuit protection in combination with OPTOTRONIC power supply
- Compliance with all relevant lighting standards

Safety information

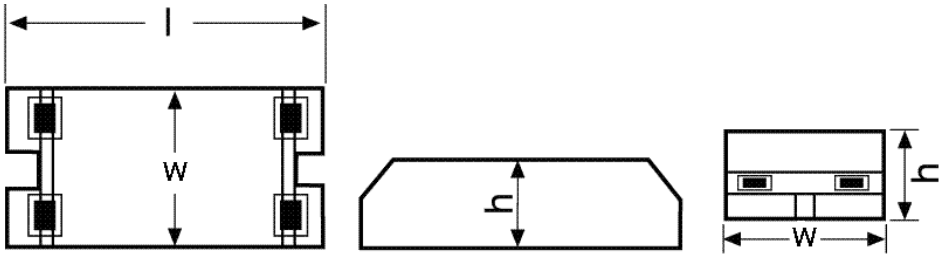


The following information is provided for your safety:

- **Please read these operating instructions carefully before installing and using the OT DMX 3x1 RGB DIM (referred as OT DMX 3x1 later on in the document). This is the only way to ensure that you use the equipment safely and correctly. Keep these operating instructions in a safe place for future reference. You should make sure that everyone who uses OT DMX 3x1 has read these operating instructions.**
- **OT DMX 3x1 may only be installed by qualified personnel who have been appropriately trained and who have the relevant authority. The installation personnel must be familiar with the operating instructions. Mains power must be disconnected before performing any changes in the electrical installation.**
- **The relevant safety and accident prevention regulations must be observed.**
- **If the control cable or switch input is wired with external voltage, particularly with a mains voltage of 230 V, the unit may be destroyed.**

Installation

Design and dimensions



Geometry (l x w x h): 80 mm x 40 mm x 22 mm

Wiring diagram

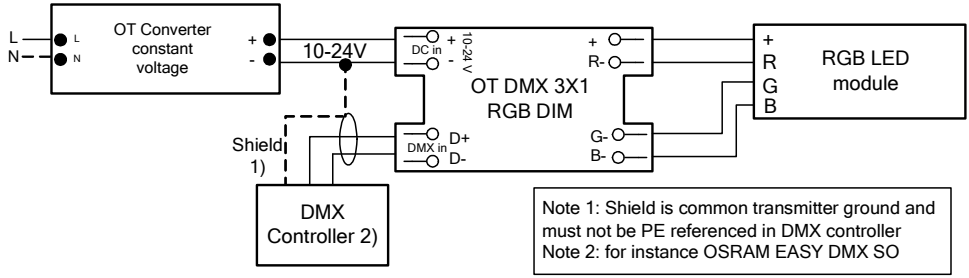


Fig. 1: DMX LED-System - OT Electronic Control Gear for LED Modules and OT DMX 3x1 RGB DIM.

Wiring

- Maximum output cable length is limited by EMI and depending on OPTOTRONIC power supply. The max. output cable length of the power supply has to be observed.
- Control interface (DMX) is not isolated from the input and output terminal, so only the connection of an unearthed SELV DMX control signal is allowed.

Connecting OT DMX 3x1 RGB DIM to constant voltage power supplies

- The OT DMX 3x1 RGB DIM is placed between the OPTOTRONIC power supply and the LED-module.
- Only 10V and 24V LED modules and power supplies are specified for the OT DMX 3x1 RGB DIM.
- The faultless operation of OT DMX 3x1 RGB DIM is only warranted with the OPTOTRONIC power supplies for 10 V and 24 V. Operation with constant current power supplies or batteries is not allowed.
- Operating voltage and power consumption of LED-Modules have to correspond with the OT's rated values.

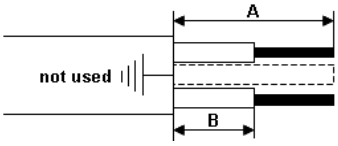
Connecting OT DMX 3x1 RGB DIM to the LED-modules

- Ensure that the LED modules rated value corresponds with the output voltage of the OPTOTRONIC power supply.
- Do not exceed a LED power consumption of 10 W for 10 V supply or 24 W for 24 V supply per output channel.

Environment protection

Maximum permissible ambient temperature (50°C) must not be exceeded. Ensure there is adequate space or ventilation to keep ambient temperature ≤ 50°C. In critical installations the temperature at tc has to be checked

Wire stripping



A = 12 mm, B = 7 mm

General note:

The luminaire manufacturer is responsible for providing the required clearances and creepage distances and also for the protection against electrical shock, especially for the line and load wires.

System extension

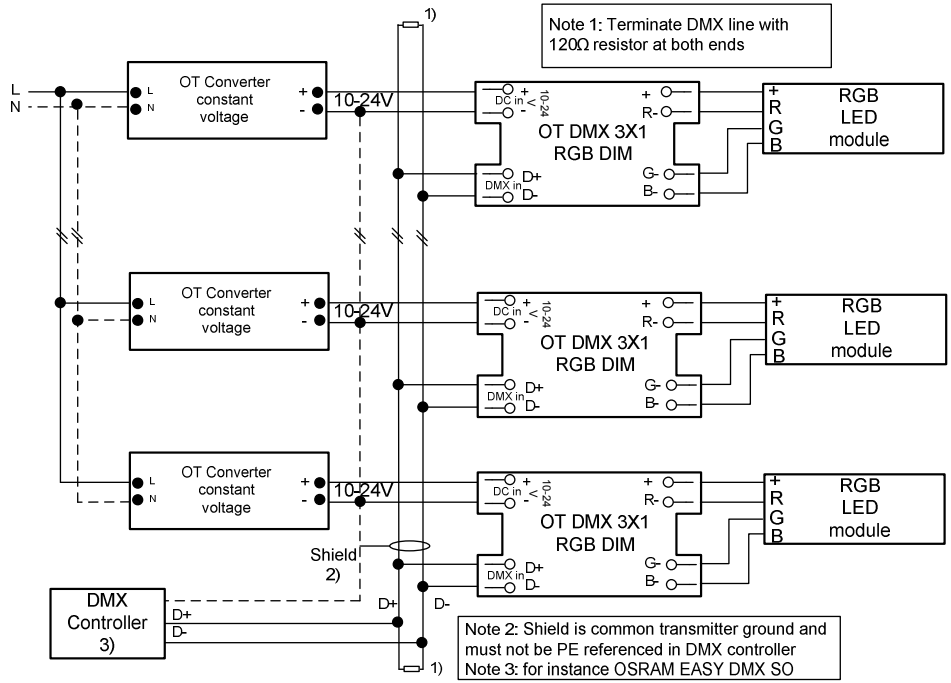


Figure 2: DMX LED-System - System expansion

An expansion of the system can be implemented by connecting the insulated DMX control line to the next OT DMX 3x1 RGB DIM device and so on.

General functions

The OT DMX 3x1 RGB DIM unit is completely driven by means of DMX input signal. Therefore a DMX signal is control unit is required.

By means of DMX signal, the unit performs the following:
- Individual mixing of colours of the LED modules by means of pulse-width modulation
- Fast colour changing sequences allowed by a very fast dimming characteristic
- Full dimming range 0 −100%

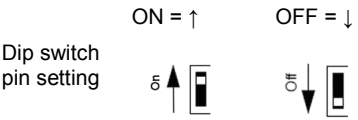
Operation modes

Two different modes of operation are permitted. Modes are selected via DIP switch settings (see Addressing section for further details):
- Normal operation: DIP switch 10 should always be Off (↓) for normal operation.

- Test mode: DIP switch 10 shall be ON (↑). As consequence the OT DMX 3x1 RGB DIM runs in test mode.

Addressing

The DMX addresses can be set via DIP switches 1…9, located on the device bottom side. The set DMX address is for the RED-channel. The GREEN- and BLUE-channel will be addressed consecutively, e.g. set DMX address 001 ➔ RED-channel: address 001; GREEN-channel: address 002 and BLUE-channel: address 003.



DMX Addressing via DIP switches

To use the DMX addressing table, first find the DMX address in the main block of the table. Then read the settings for pins 1 – 5 in the first column to the left and read the settings for pins 6 - 9 above the address.

For example, to set the DMX address to 365, you need to set DIP switch pins 1, 3,4 and 6,7, 9 to ON, as highlighted in the table.

6789 / 12345	↓↓↓↓	↑↓↓↓	↓↑↓↓	↑↑↓↓	↓↓↑↓	↑↓↑↓	↓↑↑↓	↑↑↑↓	↓↓↓↑	↑↓↓↑	↓↑↓↑	↑↑↓↑	↓↓↑↑	↑↓↑↑	↓↑↑↑	↑↑↑↑
↓↓↓↓↓		32	64	96	128	160	192	224	256	288	320	352	384	416	448	480
↑↓↓↓↓	1	33	65	97	129	161	193	225	257	289	321	353	385	417	449	481
↓↑↓↓↓	2	34	66	98	130	162	194	226	258	290	322	354	386	418	450	482
↑↑↓↓↓	3	35	67	99	131	163	195	227	259	291	323	355	387	419	451	483
↓↓↑↓↓	4	36	68	100	132	164	196	228	260	292	324	356	388	420	452	484
↑↓↑↓↓	5	37	69	101	133	165	197	229	261	293	325	357	389	421	453	485
↓↑↑↓↓	6	38	70	102	134	166	198	230	262	294	326	358	390	422	454	486
↑↑↑↓↓	7	39	71	103	135	167	199	231	263	295	327	359	391	423	455	487
↓↓↓↑↓	8	40	72	104	136	168	200	232	264	296	328	360	392	424	456	488
↑↓↓↑↓	9	41	73	105	137	169	201	233	265	297	329	361	393	425	457	489
↓↑↓↑↓	10	42	74	106	138	170	202	234	266	298	330	362	394	426	458	490
↑↑↓↑↓	11	43	75	107	139	171	203	235	267	299	331	363	395	427	459	491
↓↓↑↑↓	12	44	76	108	140	172	204	236	268	300	332	364	396	428	460	492
↑↓↑↑↓	13	45	77	109	141	173	205	237	269	301	333	365	397	429	461	493
↓↑↑↑↓	14	46	78	110	142	174	206	238	270	302	334	366	398	430	462	494
↑↑↑↑↓	15	47	79	111	143	175	207	239	271	303	335	367	399	431	463	495
↓↓↓↓↑	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496
↑↓↓↓↑	17	49	81	113	145	177	209	241	273	305	337	369	401	433	465	497
↓↑↓↓↑	18	50	82	114	146	178	210	242	274	306	338	370	402	434	466	498
↑↑↓↓↑	19	51	83	115	147	179	211	243	275	307	339	371	403	435	467	499
↓↓↑↓↑	20	52	84	116	148	180	212	244	276	308	340	372	404	436	468	500
↑↓↑↓↑	21	53	85	117	149	181	213	245	277	309	341	373	405	437	469	501
↓↑↑↓↑	22	54	86	118	150	182	214	246	278	310	342	374	406	438	470	502
↑↑↑↓↑	23	55	87	119	151	183	215	247	279	311	343	375	407	439	471	503
↓↓↓↑↑	24	56	88	120	152	184	216	248	280	312	344	376	408	440	472	504
↑↓↓↑↑	25	57	89	121	153	185	217	249	281	313	345	377	409	441	473	505
↓↑↓↑↑	26	58	90	122	154	186	218	250	282	314	346	378	410	442	474	506
↑↑↓↑↑	27	59	91	123	155	187	219	251	283	315	347	379	411	443	475	507
↓↓↑↑↑	28	60	92	124	156	188	220	252	284	316	348	380	412	444	476	508
↑↓↑↑↑	29	61	93	125	157	189	221	253	285	317	349	381	413	445	477	509
↓↑↑↑↑	30	62	94	126	158	190	222	254	286	318	350	382	414	446	478	510
↑↑↑↑↑	31	63	95	127	159	191	223	255	287	319	351	383	415	447	479	511

Table 1. DMX address settings

Note that:

- Address 000: not used
- Addresses 511 and 512 can't be set, due to missing addresses for following GREEN and BLUE channel, e.g. 511 ➔ RED: 511; GREEN: 512; BLUE: no continuing address existing !
- DIP switch 10 should always be Off (↓) for normal operation.
- Test mode: DIP switch 10: ON (↑)

Troubleshooting

The LED system is not working. *Possible cause:*

- There is no power.
- The LED module is faulty.
  Replace them.
- The LED modules are off.
  Check the wiring connection correctness or run in test mode

Technical data

Designation:	OT DMX 3x1 RGB DIM
For LED modules:	With respect to the output conditions: LINEARlight Colormix; LINEARlight Colormix Flex, COINlight Colormix, DRAGONchain Colormix, LINEARlight-DRAGON Colormix and other appropriate modules
Supply input voltage range nom.:	10,5 - 24 V DC
Supply input voltage range min - max:	8,5…25 V DC
Power losses:	1,5 W
Control signal:	DMX (SELV equivalent) acc. USITT DMX-512A, DMX512 (DIN 56930-2)
Electrical specification:	ANSI/TIA/EIA-485-A-1998
Galvanic separation:	No, SELV required (acc. to EIA-485)
Control signal range:	-7…+12VDC, (without damage to the device)
Dimming modus:	PWM
Dimming range:	0…100%
Dimming curve:	approximate to EN 60929:2004 E.4.3.7
Output current max:	1 A for each channel
Output load range:	0 - 10 W per channel @ 10,5 V DC / 0 - 24 W per channel @ 24 V DC
Normative references:	EN 55015, IEC 61347, EN 61547
Protection class:	II
Protection type:	IP 20
Ambient temperature range:	-20 °C to +50 °C
No-load proof:	Yes
Short circuit protection:	Yes, electrically reversible for each channel
Overload protection:	Yes, electrically reversible for each channel
Over temperature protection:	Yes, reversible
Wire cross section for push in terminals:	0,5 mm² to 1.5 mm² massive leads 0,75 mm² to 1 mm² flexible leads
Max. cable length:	10 m with 1.5 mm² massive leads
Geometry (l x w x h):	80 mm x 40 mm x 22 mm
Approvals:	CE

CE The CE symbol signifies compliance with the relevant EU Directives.